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(74) Agent: CRAWFORD, Robert, J.; Crawford Maunu PLLC, 1270 Northland Drive, Suite 390, St. Paul, MN 55120 (US).

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(71) Applicant: THE BOARD OF TRUSTEES OF THE LEELAND STANFORD JUNIOR UNIVERSITY [US/US]; 1705 El Camino Real, Palo Alto, CA 94306-1106 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): GOPALAKRISHNAN, Kailash [IN/US]; 121 Campus Drive, Apt. #1116B, Stanford, CA 94305 (US). PLUMMER, James, D. [US/US]; 2 Bayberry, Portola Valley, CA 94028 (US).

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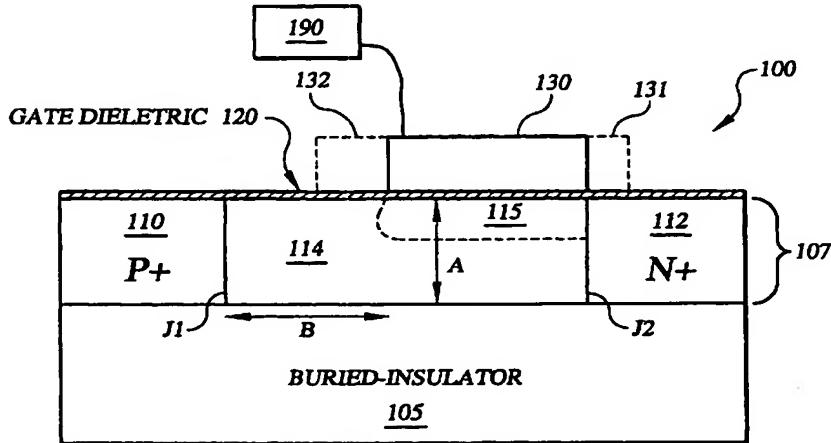
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(54) Title: INSULATED-GATE SEMICONDUCTOR DEVICE AND APPROACH INVOLVING JUNCTION-INDUCED INTERMEDIATE REGION



(57) Abstract: Semiconductor device performance is improved via an insulated-gate PIN-type structure that is adapted to abruptly switch between conductance states by modulating an electric field in the intermediate (I) region. According to an example embodiment of the present invention, an insulated gate-type structure includes a body with first and second end regions and an intermediate region coupled therebetween, the intermediate region having a length defined by junctions at the first and second regions. The first and second end regions have opposite polarizations and the intermediate region has a polarization that is neutral relative to the polarizations of the first and second end regions. The insulated gate-type structure also includes a gate that is coupled to the intermediate region and adapted, with the intermediate region, to apply an electric field nearer one of the two junctions. With the body reverse biased, the electric field can be modulated to switch the structure between a stable state and a current-conducting state in which an avalanche breakdown occurs in the intermediate region.

WO 2004/001801 A2